

# Welcome to Using Perlmutter Training



Jan 5-7, 2022

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User Engagement Group

# Some Logistics (1)

- This hands-on training is jointly provided by HPE and NERSC staff
  - Thanks to all contributing to presentations, hands-on, and Q&A help
- Encourage to review [June 2021 Perlmutter Introduction training](#) materials
- Muted upon joining Zoom due to large number of attendees
- Please change your name in Zoom session as “first\_name last\_name (nersc\_user\_name)”, such as “Helen He (yunhe)”
  - Click “Participants”, then “More” next to your name to rename
- Live “Captions” and “View Full Transcripts” are enabled
- Please ask your questions in GDoc (preferred) instead of Zoom chat
  - <https://tinyurl.com/Perlmutter-QnA-Jan2022>
  - Ask questions in the respective sections

# Some Logistics (2)

- Existing users are added to **ntrain3** project
- Training account expires Jan 14
- Compute node reservations
  - Jan 5, 9:30-12:30: --reservation=perlmutter\_day1 -A ntrain3\_g
  - Jan 6, 9:30-12:30: --reservation=perlmutter\_day2 -A ntrain3\_g
  - Jan 7, 12:30-14:30: --reservation=perlmutter\_day3 -A ntrain3\_g
- Please install NX (NoMachine)
  - Improves X-forwarding when using GUI tools
  - Needed for Day 2 hands-on with performance and debugging tools
  - Instructions at: <https://docs.nersc.gov/connect/nx/>
- Slides and videos will be available afterwards
  - <https://www.nersc.gov/users/training/events/using-perlmutter-training-jan2022>
- Please help us with answering the survey afterwards
  - <https://tinyurl.com/Perlmutter-survey-Jan2022>

Day 1, 8:30 am - 12:30 pm (Pacific time), January 5, Wednesday

Mostly on GPU

Time (PDT)	Topic	Presenters
8:30 am	Introduction (5 min)	Helen He (NERSC)
8:35 am	Perlmutter Hardware Overview (10 min)	Chris Marsh (HPE)
8:45 am	Lmod (10 min)	Chris Marsh (HPE)
8:55 am	CPE and Compilers (10 min)	Chris Marsh (HPE)
9:05 am	MPI and scientific libraries (15 min)	Chris Marsh (HPE)
9:20 am	Break (10 min)	
9:30 am	Building and running applications on Perlmutter GPU Part 1, with hands-on (1 hr)	Steve Leak, Muaaz Awan, Rahul Gayatri, Helen He, Kevin Gott, Ronnie Chatterjee (NERSC)
10:30 am	Lunch break for ET/CT (30 min)	
11:00 am	Building and running applications on Perlmutter GPU Part 2, with hands-on (1.5 hr)	Steve Leak, Muaaz Awan, Rahul Gayatri, Helen He, Kevin Gott, Ronnie Chatterjee (NERSC)
12:30 pm	End of Day 1	

Day 2, 8:30 am - 12:30 pm (Pacific time), January 6, Thursday

Mostly on CPU

Time (PDT)	Topic	Presenters
8:30 am	Single CPU node optimization (cache utilization) (15 min)	Chris Marsh (HPE)
8:45 am	Perftools (40 min)	Chris Marsh (HPE)
9:25 am	Break (5 min)	
9:30 am	Perftools hands-on (1 hr)	Chris Marsh (HPE), Woo-Sun Yang, Ronnie Chatterjee (NERSC)
10:30 am	Lunch break for ET/CT (30 min)	
11:00 am	Reveal - Live Demo (40 min)	Chris Marsh (HPE)
11:40 am	gdb4hpc (20 min)	Chris Marsh (HPE)
12:00 pm	gdb4hpc hands-on (30 min)	Chris Marsh (HPE)
12:30 pm	End of Day 2	



Day 3, 8:30 am - 2:00 pm (Pacific time), January 7, Friday

Mostly on GPU

Time (PDT)	Topic	Presenters
8:30 am	Introduction, GPU 101 concepts (45 min) -- A100 -- Tensor cores -- Memory Management -- General Recommendations -- NESAP codes achievements	Jack Deslippe (NERSC)
9:15 am	Break (5 min)	
9:20 am	Overview programming models for GPU (1 hr) -- Overview of all models -- OpenMP + Fortran + OpenACC -- CUDA/HIP -- C++/Kokkos/SYCL	Brandon Cook, Chris Daley, Kevin Gott, Rahul Gayatri (NERSC)
10:20 am	Lunch break for ET/CT (30 min)	
10:50 am	Python + Jupyter (30 min)	Laurie Stephey, Daniel Margala, Rollin Thomas (NERSC)
11:20 am	ML/DL (60 min)	Steven Farrell, Peter Harrington (NERSC)
12:20 pm	Break (10 min)	
12:30 pm	Hands-on: Python, Jupyter, ML/DL (1.5 hr)	Laurie Stephey, Daniel Margala, Rollin Thomas, Steven Farrell, Peter Harrington (NERSC)
2:00 pm	End of Day 3	



# Nvidia HPC SDK Training, Jan 12-13

- A hands-on training provided by Nvidia next week
- **Nvidia HPC SDK compiler**
  - **Default and recommended compiler for Perlmutter GPU**
- Topics include:
  - GPU architecture and HPC SW developer considerations
  - Standard Language Acceleration and Libraries
  - OpenACC
  - OpenMP offload
  - CUDA
  - Profiling tools
- Registration and more info at:  
<https://www.nersc.gov/users/training/events/nvidia-hpcsdk-training-jan2022/>



Thank You!

